Session: Protected Species
Economics of Protected Species

Kathryn D. Bisack

A 2014 NOAA workshop initiated the process of identifying national economic management and research needs for Protected Resource (PR) science based on 25 years (1990 – 2014) of PR economic regulatory history across NMFS (Bisack et. al, 2015). Sharing of issues & research showed large gaps remain:

- Expand Cost-Benefit Analysis ~ all threats, national/international
- Invest in valuation methods ~ individual species/ecosystem services (e.g. corals)
- Post policy instrument analysis ~ evaluate how well instruments work
- Involve economists early
- Economists need to communicate better ~ explain what we do, what it means and why it matters.

All Threats: While we have experience with managing commercial fisheries bycatch (PR and non-PR), new methods are needed to mitigate other threats such as recreational fisheries, tourism, pollution, climate change, habitat degradation, ecosystem alterations, and energy exploration. Increasing competition for marine resources combined with these threats warrant an approach to marine management that balances trade-offs among competing uses (and non-use) of the marine environment while protecting ecosystem integrity and it's derived goods and services. Identifying primary challenges associated with specific PR economic research and/or applications in a CBA framework will advance Ecosystems Based Management (EBM) to a more fully integrated, interdisciplinary approach.

Expand Cost-Benefit Analysis (CBA) and Invest in Valuation Methods: Executive Order (EO) 12866 mandates a CBA framework to assess all attributable beneficial and adverse economic impacts of each proposed regulatory action alternative; net benefit to the Nation shall be maximized. In the absence of data on economic benefits, a cost-effective-analysis (CEA) is conducted, resulting in the least-cost choice. A full CBA would allow considerations of a fuller suite of recovery methods that may be excluded in the CEA. Some valuation work has been done by S&T for these species; however, the analyses have yet to be evaluated for use in regulatory applications. A NMFS eco-systems services valuation working group has been formed to address national and regional needs.

Post Policy Instrument Analysis: As regulations multiply, the need for retrospective analysis and evaluation grows in order to inform future policy decisions. While a suite of instruments may be necessary to mitigate one threat to one species, in a climate opposed to additional regulations, an evaluation of previous actions is critical. Understanding the strengths and weaknesses of policy instrument choices to support better forecasting going forward is necessary for recovery planning. Economic incentives, market based management tools for example (e.g. catch share programs, permit buy-backs, conservation leasing, etc.), are used in commercial fisheries; the evaluation of these programs on protected species is limited.

Multiple criteria are necessary to evaluate proposed policy instruments; biological factors should be considered with social-normative, longevity of the instrument along with economics factors to mitigate threats (PR and non-PR) (Bisack and Magnusson, 2016). Compliance and participation can provide proxies for the degree of social-normative usability of a policy instrument. If goals are not met, such as exceeding fishery bycatch targets, non-compliance could be the source of failure and not the policy instrument itself (Bisack and Das, 2016). A collective consideration of policy instrument choice, observer sampling, as well as economic and normative factors, should support greater success in achieving management objectives.

Involve economists early and communicate our products. The Protected Resource Economic Fact Sheet was presented to the Protected Resource Scientific Investment Planning Process (PRSIPP) steering committee (Balance et. al, 2014) to communicate case studies completed by NMFS economists and demonstrate the contribution economics can make to research and management; see the "Economic Value of Scientific Information" (Bisack and Magnusson, 2014).(http://www.st.nmfs.noaa.gov/economics/protected-species/index).

Use of Economic Information with Fisheries Bycatch Mitigation: In the northeast, economic requests are exclusively in support of PR regulatory analysis requirements after mitigation decisions have been finalized and meetings have occurred (i.e. the preferred alternative has been chosen). Much of these analyses are contracted out by the regional office and participation in infrastructure building is absent. Multiple ESA and MMPA species are bycaught in commercial fisheries in the north Atlantic. Five of the seven active TRTs around the United States exist in the Atlantic; they include the Atlantic Large Whale, Atlantic Trawl Gear, Bottlenose Dolphin, Harbor Porpoise, and Pelagic Longline. The teams review and recommend specific bycatch mitigation measures within various northeast and southeast fishery management plans and different types of fishing gear for marine mammals exclusively. ESA species such as loggerhead turtles do not have an external mitigation review process.

Future and Current Case Studies:
Squires and Garcia with Bull et.al (2013) identify four steps in the bio-diversity mitigation hierarchy (BMH): (1) avoidance of bycatch; (2) minimize bycatch; (3) rehabilitation / restoration / remediation of bycatch stock and/or habitat; and; (4) residual (compensatory biodiversity offsets). Cost data are available to compare bio-economic efficiency across various conservation alternatives. Methods to address benefits where information is limited is ongoing.

- A scoping study on potential conservation projects for Atlantic sea turtles
    - A holistic multi-pronged approach that includes both reducing mortality and increasing survival rates is under way for endangered stocks such as leatherback and loggerhead sea turtles One threat according to the loggerhead recovery plan is turtle bycatch in gillnet, trawl and longline fisheries which operate from the Gulf of Mexico to the Gulf of Maine. An inter-disciplinary team with members at the northeast and southeast science centers are engaged in evaluating the fisheries bycatch threat within the mitigation hierarchy framework. All threats are being evaluated to determine where social sciences can make a contribution to their recovery. (See case study "Cost-Effective-Analysis of Conservation Strategies" http://www.st.nmfs.noaa.gov/economics/protected-species/cost-benefits)
- Application of a Bio-Diversity Mitigation Hierarchy Framework to the North Atlantic Right Whale: A Large Scale Management Strategy Evaluation Approach to US and Canadian Recovery Measures
    - Management actions to recover the NARW have been underway for several decades; the first recovery plan in the US was published in 1991 and the initial plan in Canada was finalized in 2009. Despite these measures recent evidence suggests the NARW population is not increasing. A framework is needed to comprehensively evaluate a suite of protection measures, not only within the US but across national boundaries, to increase the chances of recovery and to determine comparability of protection measures for these transboundary species. (http://www.fisheries.noaa.gov/ia/slider_stories/2016/08/mmpafinalrule.html).
    - Bisack and Magnusson. 2017. Case Study: Effectiveness of Dynamic Management Areas to protect north Atlantic right whale. Presented at the North American Association of Fisheries Economics, Mexico, March 20

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